

that defines an electrolyte cell to facilitate metal deposition on the substrate 22 that is substantially similar to the enclosure 30 described above. The enclosure 1102 of the plating station 1002 is coupled to a motor that provides rotation of the enclosure 1102.

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The arrangement of the plating stations 1002 and polishing stations 1006 on the depositing and planarizing module 1012 allow for the substrate 22 to be sequentially plated or polishing by moving the substrate between stations. The substrate 22 may be processed in each station 1002, 1006 while remaining in its respective head or carrier 1038, 1004, or the substrate may be switched between heads by offloading the substrate from one head into the load cup and loading into the substrate into the other polishing head. Optionally, the depositing and planarizing module 1012 may comprise only one type of head may be utilized (i.e., all polishing heads 1038 or all carrier heads 1004).

IN THE DRAWINGS:

Redlined copies of Figures 2 and 4A are attached to an accompanying drawing amendment showing the omitted reference numbers "48" and "84" in Figure 2 and the corrections of typographical errors for the reference numbers "402", and "404" in Figure 4A.

IN THE CLAIMS:

Please amend claims 1, 14-16, 19, and 26-27 with the replacement claims presented below.

Please cancel claims 30-88 without prejudice.

Please add new claims 89-119.

1. (Amended) An apparatus for depositing and planarizing a material on a substrate, comprising:

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a) a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet;

- b) a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;
- c) a permeable disc disposed in the partial enclosure;
- d) a diffuser plate disposed in the partial enclosure and positioned below the permeable disc; and
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ent e) a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate and a plurality of electrical contacts disposed about the perimeter of the substrate receiving surface.
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2. The apparatus of claim 1, further comprising a second fluid inlet disposed above the permeable disc to deliver a fluid onto the permeable disc.
3. The apparatus of claim 1, wherein the first fluid inlet is disposed in a portion of the shaft fluidly connected with the partial enclosure.
4. The apparatus of claim 1, wherein the diffuser plate is made of a plastic.
5. The apparatus of claim 1, further comprising an anode disposed in the partial enclosure below the diffuser plate.
6. The apparatus of claim 1, wherein the permeable disc comprises polyurethane.
7. The apparatus of claim 1, wherein the diffuser plate is comprised of a material selected from the group of fluoropolymers, PE, HDPE, UHMW and combinations thereof.
8. The apparatus of claim 7, wherein the diffuser plate comprises a plurality of holes formed therein.
9. The apparatus of claim 1, wherein the permeable disc comprises a plurality of pores disposed therein for flow of material therethrough.

10. The apparatus of claim 1, wherein the permeable disk further comprises grooves.

11. The apparatus of claim 5, wherein the anode is a consumable comprising the same material as a conductive material to be deposited on a substrate surface.

12. The apparatus of claim 5, wherein the anode is in contact with the permeable disk.

13. The apparatus of claim 5, further comprising a membrane disposed between the anode and permeable disk.

14. (Amended) The apparatus of claim 1, wherein the apparatus provides orbital motion, circular rotation, translational motion, or linear motion between the substrate and the permeable disk.

AB 15. (Amended) A processing system for forming a planarized layer on a substrate, comprising:

a) a processing platform having two or more processing stations, a loading station and a substrate transfer device disposed above the processing stations and the loading station;

b) a processing apparatus positioned at each processing station, the processing apparatus comprising:

(i) a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet;

(ii) a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

(iii) a permeable disc disposed in the partial enclosure;

(iv) a diffuser plate disposed in the partial enclosure and positioned below the permeable disc; and

(v) a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate and a plurality of electrical contacts disposed about the perimeter of the substrate receiving surface.

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cont 16. (Amended) The processing system of claim 15, wherein the processing apparatus further comprises a second fluid inlet disposed above the permeable disc to deliver a fluid onto the permeable disc.

17. The processing system of claim 15, wherein the first fluid inlet is disposed in a portion of the shaft fluidly connected with the partial enclosure.

18. The processing system of claim 15, wherein the diffuser plate is made of a plastic.

A7 19. (Amended) The processing system of claim 15, wherein the processing apparatus further comprises an anode disposed in the partial enclosure below the diffuser plate.

20. The processing system of claim 15, wherein the permeable disc comprises polyurethane.

21. The processing system of claim 15, wherein the diffuser plate is comprised of a material selected from the group of fluoropolymers, PE, HDPE, UHMW and combinations thereof.

22. The processing system of claim 15, wherein the permeable disc comprises a plurality of pores disposed therein for flow of material therethrough.

23. The processing system of claim 15, wherein the permeable disk further comprises grooves.

24. The processing system of claim 19, wherein the anode is a consumable comprising the same material as a conductive material to be deposited on a substrate surface.

25. The processing system of claim 19, wherein the anode is in contact with the permeable disk.

26. (Amended) The processing system of claim 15, wherein the processing apparatus provides orbital motion, circular rotation, translational motion, or linear motion between the substrate and the permeable disk.

27. (Amended) The processing system of claim 15, wherein the processing apparatus further comprises a membrane disposed between the anode and permeable disk.

28. The processing system of claim 15, further comprising one or more additional processing stations capable of polishing conductive materials from the substrate surface.

29. The processing system of claim 15, further comprising one or more additional processing stations capable of polishing dielectric materials from the substrate surface.

89. (Added) An apparatus for depositing and planarizing a material on a substrate, comprising:

A9 a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet;

 a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

 an electrode disposed in the partial enclosure;

 a permeable disc disposed in the partial enclosure and supported at a distance spaced from the electrode; and

a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate, and a plurality of electrical contacts disposed to contact the surface of the substrate.

90. (Added) The apparatus of claim 89, further comprising a diffuser plate disposed in the partial enclosure and positioned below the permeable disc.

91. (Added) The apparatus of claim 89, wherein the permeable disc comprises polyurethane.

92. (Added) The apparatus of claim 89, further comprising a membrane disposed between the electrode and permeable disc.

93. (Added) The apparatus of claim 89, wherein the apparatus provides orbital motion, circular rotation, translational motion, or linear motion between the substrate and the permeable disc.

94. (Added) The apparatus of claim 89, wherein the substrate is held movable between a first processing position and a second processing position.

95. (Added) An apparatus for depositing and planarizing a material on a substrate, comprising:

a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet for flowing electrolyte into and outside the partial enclosure;

a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

a permeable disc disposed in the partial enclosure; and

a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate between a first processing position and a second processing position, and a plurality of electrical contacts disposed to contact the surface of the substrate.

96. (Added) The apparatus of claim 95, further comprising a diffuser plate disposed in the partial enclosure and positioned below the permeable disc.

97. (Added) The apparatus of claim 95, wherein the permeable disc comprises polyurethane.

98. (Added) The apparatus of claim 95, further comprising an electrode disposed in the partial enclosure below the permeable disc.

99. (Added) The apparatus of claim 98, further comprising a membrane disposed between the electrode and permeable disc.

100. (Added) The apparatus of claim 95, wherein the apparatus provides orbital motion, circular rotation, translational motion, or linear motion between the substrate and the permeable disc.

101. (Added) An apparatus for depositing and planarizing a material on a substrate, comprising:

a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet for flowing electrolyte into and outside the partial enclosure;

a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

a permeable disc disposed in the partial enclosure; and

a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate at a first processing position adapted at a distance away from the permeable disc and at a second processing position adapted to be in close proximity to the permeable disc, and a plurality of electrical contacts disposed to contact the surface of the substrate.

102. (Added) A processing system for forming a planarized layer on a substrate, comprising:

a processing platform having two or more processing stations, a loading station and a substrate transfer device disposed above the processing stations and the loading station; and

one or more processing apparatuses positioned at one or more processing stations, wherein the one or more processing apparatuses comprises:

a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet for flowing electrolyte into and outside the partial enclosure;

a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

a permeable disc disposed in the partial enclosure; and

a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate and a plurality of electrical contacts disposed to contact the surface of the substrate.

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103. (Added) The processing system of claim 102, wherein the one or more processing apparatuses provides orbital motion, circular rotation, translational motion, or linear motion between the substrate and the permeable disc.

104. (Added) The processing system of claim 102, further comprising one or more additional processing apparatuses positioned at the one or more processing stations capable of polishing materials from the substrate surface.

105. (Added) The processing system of claim 102, wherein the substrate is held by the substrate carrier of the one or more processing apparatuses between a first processing position and a second processing position.

106. (Added) The processing system of claim 102, wherein the substrate is processed by two or more processing apparatuses.

107. (Added) The processing system of claim 102, wherein the substrate is processed by a first processing apparatuses for deposition of the material on the substrate, and a second processing apparatuses for planarizing the substrate.

108. (Added) The processing system of claim 102, wherein the substrate is held at a first processing position adapted to be at a distance away from the permeable disc.

109. (Added) The processing system of claim 102, wherein the substrate is held at a second processing position adapted to be in close proximity to the permeable disc.

110. (Added) The processing system of claim 102, wherein the one or more processing apparatuses further comprises a diffuser plate disposed in the partial enclosure and positioned below the permeable disc.

111. (Added) The processing system of claim 102, wherein the permeable disc comprises polyurethane.

112. (Added) The processing system of claim 102, wherein the one or more processing apparatuses further comprises an electrode disposed in the partial enclosure below the permeable disc.

113. (Added) The processing system of claim 112, wherein the one or more processing apparatuses further comprises a membrane disposed between the electrode and permeable disc.

114. (Added) The processing system of claim 102, wherein the one or more processing apparatuses provides orbital motion, circular motion, translational motion, or linear motion between the substrate and the permeable disc.

115. (Added) A processing system for forming a planarized layer on a substrate, comprising:

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a processing platform having two or more processing stations, a loading station and a substrate transfer device disposed above the processing stations and the loading station; and

one or more processing apparatuses positioned at each processing station, wherein the one or more processing apparatuses comprise:

a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet for flowing electrolyte into and outside the partial enclosure;

a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

a permeable disc disposed in the partial enclosure; and

a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate between a first processing position and a second processing position and a plurality of electrical contacts disposed to contact the surface of the substrate.

116. (Added) A processing system for forming a planarized layer on a substrate, comprising:

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ad a processing platform having two or more processing stations, a loading station and a substrate transfer device disposed above the processing stations and the loading station; and

one or more processing apparatuses positioned at each processing station, wherein the one or more processing apparatuses comprise:

a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet for flowing electrolyte into and outside the partial enclosure;

a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

an electrode disposed in the partial enclosure;

a permeable disc disposed in the partial enclosure and supported at a distance spaced from the electrode; and

a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate

between a first processing position and a second processing position and a plurality of electrical contacts disposed to contact the surface of the substrate.

117. (Added) A processing system for forming a planarized layer on a substrate, comprising:

a processing platform having two or more processing stations, a loading station and a substrate transfer device disposed above the processing stations and the loading station;

one or more first processing apparatuses positioned at one or more processing stations, wherein the one or more first processing apparatuses comprise:

a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet for flowing electrolyte into and outside the partial enclosure;

a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

a permeable disc disposed in the partial enclosure; and

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a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate between a first processing position and a second processing position and a plurality of electrical contacts disposed to contact the surface of the substrate; and

one or more second processing apparatuses, capable of polishing the substrate and positioned at one or more processing stations.

118. (Added) A processing system for forming a planarized layer on a substrate, comprising:

a processing platform having two or more processing stations, a loading station and a substrate transfer device disposed above the processing stations and the loading station;

one or more first processing apparatuses positioned at one or more processing stations, the processing apparatus comprising:

a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet for flowing electrolyte into and outside the partial enclosure;

a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

an electrode disposed in the partial enclosure;

a permeable disc disposed in the partial enclosure and supported at a distance spaced from the electrode; and

a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate and a plurality of electrical contacts disposed to contact the surface of the substrate ; and

one or more second processing apparatuses, capable of chemical mechanical polishing the substrate and positioned at one or more processing stations.

119. (Added) A processing system for forming a planarized layer on a substrate, comprising:

a processing platform having two or more processing stations, a loading station and a substrate transfer device disposed above the processing stations and the loading station;

one or more first processing apparatuses positioned at one or more processing stations, the processing apparatus comprising:

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a partial enclosure defining a processing region and having a fluid inlet and a fluid outlet for flowing electrolyte into and outside the partial enclosure;

a shaft connected to the partial enclosure on one end and to an actuator on an opposing end thereof and adapted to rotate the partial enclosure;

a permeable disc disposed in the partial enclosure; and

a substrate carrier vertically and laterally movable above the permeable disc, the substrate carrier having a substrate mounting surface to hold the substrate at a first processing position for deposition of the material on the substrate and at a second processing position for planarizing the substrate and a plurality of electrical contacts disposed to contact the surface of the substrate ; and

one or more second processing apparatuses, capable of chemical mechanical polishing the substrate and positioned at one or more processing stations.